USEUCOM AOR
Influenza Season Summary
2006-2007
28 September 2007

OVERVIEW & SUMMARY: Enhanced, year-round influenza surveillance was launched in the EUCOM AOR in fall of 2006 with support from DoD-GEIS, and will continue during the 2007-8 season. MTFs are asked to collect nasopharyngeal swabs from patients presenting with fever ≥100.5°F/38°C plus cough and/or sore throat (DoD ILI case definition). LRMC Microbiology conducts testing (BinaxNOW® flu A-B rapid test, flu PCR, viral Cx), while CHPPMEUR provides epidemiologic support. Patient information and positive specimens are forwarded to AFIOH to contribute to the DoD Global Influenza Surveillance program.

A total of 1,858 specimens have been submitted to date from among 37 bases/installations within the AOR, which involved the participation of more than 250 clinicians. Of the 1,814 specimens with PCR/Cx results available as of 28 Sep, a total of 554 (31%) tested positive for any virus(es) while 334 (18%) specifically tested positive for influenza.

Lab-confirmed activity influenza was most intense this season from mid-Feb to mid-March (weeks 07-11), which was similar to Europe (EISS) but several weeks behind the US (CDC). Type A flu dominated (92%), as it did in Europe (98%) and the US (79%). However, subtypes differed. A/H3N2 was dominant in the EUCOM (~72% of all flu) and Europe (~90%), while A/H1N1 was most common in the US, where it made up 50% of all influenza in comparison to only 29% for A/H3N2.

By mid-January 2007, about 91% of AD in Europe had been vaccinated against influenza. Using the endpoint of lab-confirmed flu, Vaccine Effectiveness was estimated to be 52% this season. While this is below the 70-90% expected when there is a good match between the vaccine and circulating strains, it still offers important protection against infection as well as disease severity.

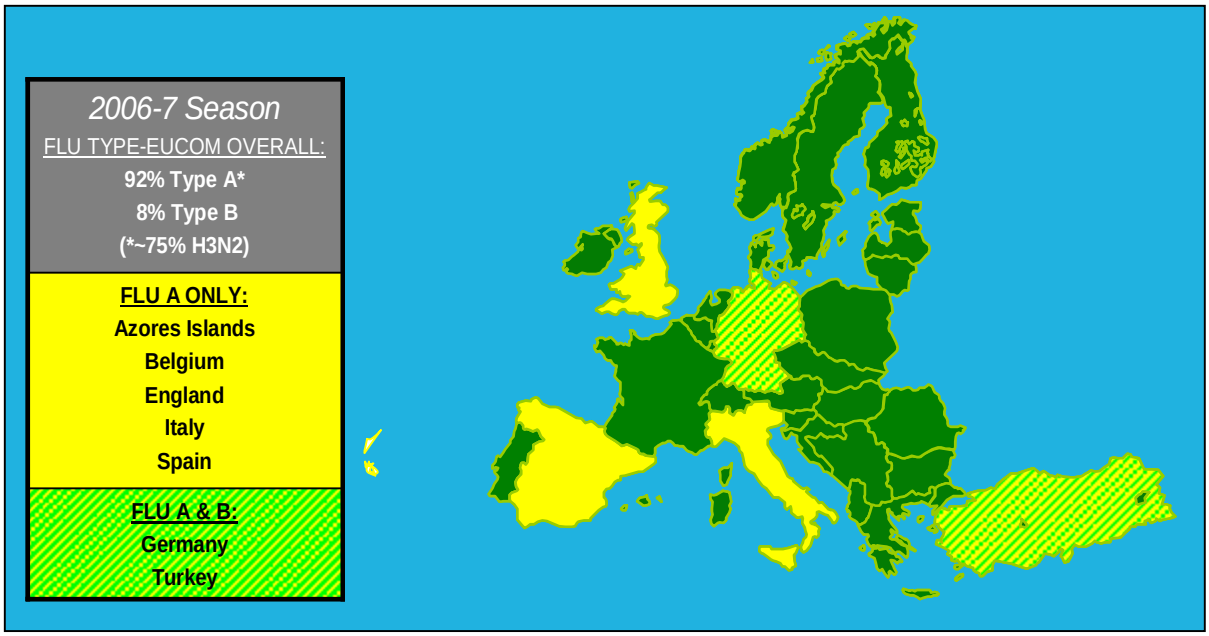
For the 2007-8 seasonal vaccine, WHO recommended keeping the A/H3N2-like and B/Malaysia-like viruses but adding a new A/H1N1 component - "A/Solomon Islands/3/2006 (H1N1)-like virus". This is a recent *antigenic variant* of the 2006-7 vaccine strain "A/New Caledonia/20/99 (H1N1).

2006-7 Influenza Surveillance Awards for Most Positives Specimens Submitted with Questionnaires

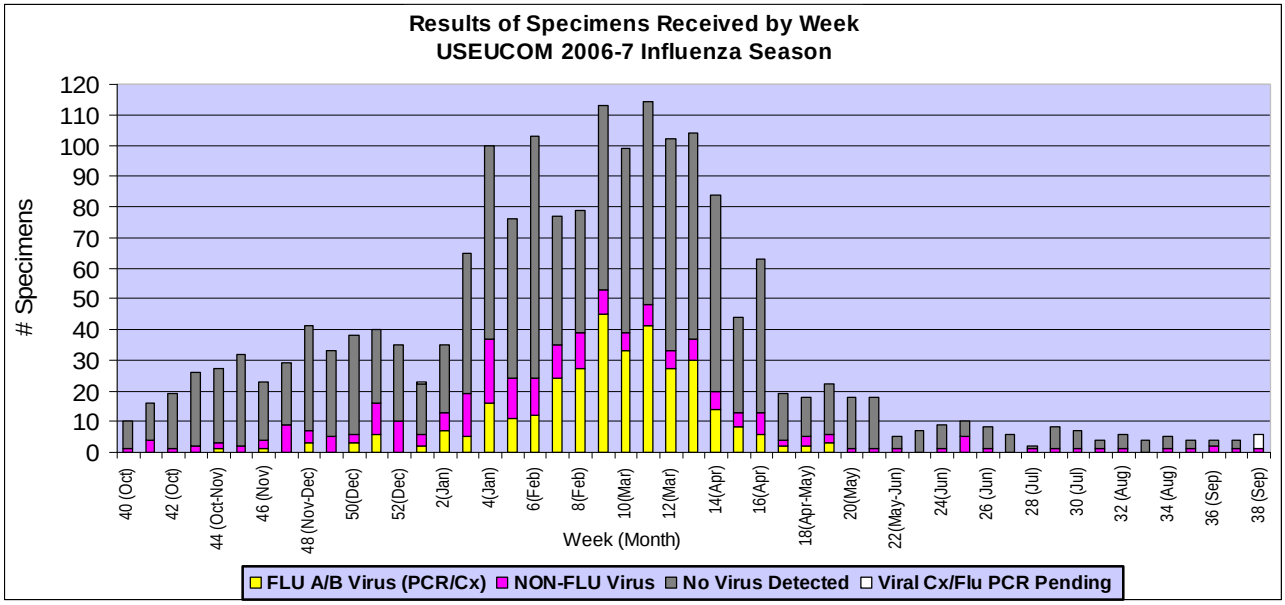
Host Nation…..	Clinician
Belgium	Brian R. Johnson
England	Tie: Shelly Behlen; Michael W. Stacy
Germany-Landstuhl	Mary J. Choi
Germany-Outside Landstuhl	David R. Olson (Baumholder)
Italy	Peter J. Lodico
Portugal	Bret D. Heerema
Spain	Walter M. Greenhalgh
Turkey	Elizabeth Erickson

Congratulations! And a sincere thank you to each and every clinician, clinical site, and all others who supported influenza surveillance this season all across Europe.

INFLUENZA TYPE BY HOST NATION LOCATION:



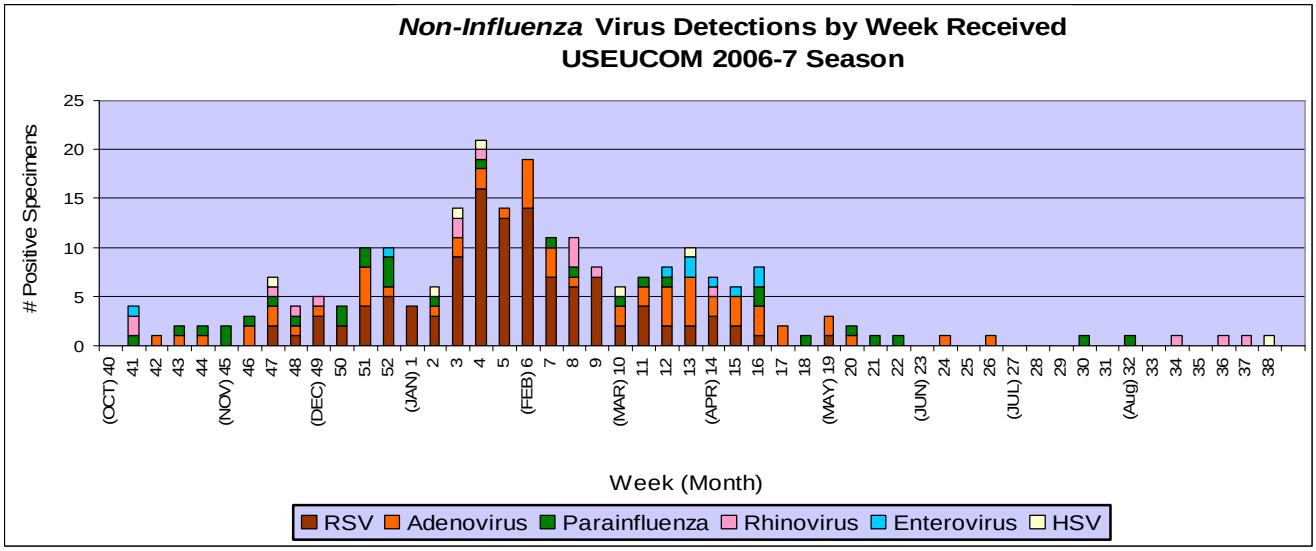
LAB SURVEILLANCE RESULTS: A total of 1,858 specimens have been submitted to LRMC Micro since the flu surveillance season began on 1 Oct. As of 28 Sep 2007, 1,814 specimens had flu PCR or viral Cx results available. Of the 44 without available results, 9 were pending and 35 were not processed due to duplicate orders, specimen leakage, contamination, etc. A total of 554 out of the 1,814 (31%) tested positive for a virus(es); 334 (18%) were specifically positive for influenza A or B, while 200 (13%) were positive for a non-influenza virus.



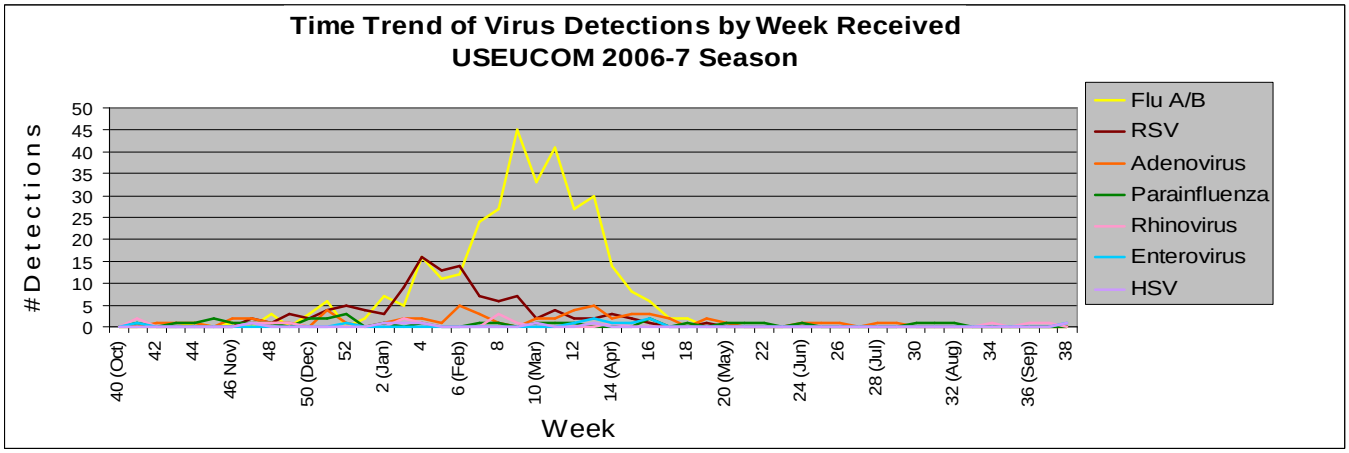
- Influenza results are from PCR &/or Cx. Non-influenza virus results are from PCR/Cx for RSV & adenovirus; from Cx only for parainfluenza, rhinovirus, HSV, & enterovirus. Cx results are complete through Week 36 (8 Sep). Final Cx results may take up to 10-14 days. PCR results may be processed within a few hours. For most specimens (~94%), week received was the same as week of specimen collection.

Among the 554 positive specimens to date, six were co-infections, increasing the number of virus detections to 560. None of the co-infections were influenza-influenza. The 560 viruses were distributed as follows: 334 influenza (334/560=60%), 98 RSV (17.5 %), 66 adenovirus (12%), 30 parainfluenza (5%), 17 rhinovirus (3%), 9 enterovirus (1.5%), and 6 HSV (1%). Of the 30 parainfluenza viruses, 19 were typed and the majority (15, or 79%) were parainfluenza-3, which is often associated with bronchiolitis and pneumonia. The remaining four were typed as parainfluenza-2, which is a leading cause of croup in children.

The most common detections since the end of the active flu season (late April) have been adenoviruses and parainfluenza, viruses which can circulate during summer as well as throughout the year. Infection with either virus can range from "common cold" symptoms to bronchitis, croup, or pneumonia. Rhinoviruses have emerged in the past few weeks. Outbreaks of this "common cold" virus often occur in fall. **Circulating rhinoviruses are likely responsible for some of the recent ILI and Respiratory syndromic alerts in ESSENCE.**



The line graph below shows occasional adenovirus and parainfluenza detections throughout the year vs. the seasonal pattern and distinct peaks (outbreaks) of RSV and influenza. An upsurge in lab-confirmed flu is also noted to coincide with a decline in RSV activity - this relationship has been observed by other surveillance systems.



LAB-CONFIRMED FLU BY PATIENT CATEGORY & AGE GROUP: The table below shows that children composed the largest patient category, followed by the AD. Vaccination status is probably under-reported for non-AD adults & children, as only one of the Service's vaccination databases (AFCITA) currently includes dependents. This highlights the importance of the surveillance questionnaires, which accompanied 67% of the respiratory specimens that tested positive for influenza. The questionnaires record valuable patient data such as vaccination status and recent travel, and also contribute to the DoD global surveillance program.

Nine of the 152 pediatric cases were infants who were under 6 months of age, and thus too young for the FDA-approved vaccine. It should also be noted that among the 334 total cases were 13 pairs of family members (N=26 cases). In two families, the mother was diagnosed one week before her very young infant (<6 months), and the father in each family was AD and had been vaccinated. Six of the family member case pairs (N=12) were made up of siblings, and each sibling pair was diagnosed in the same week.

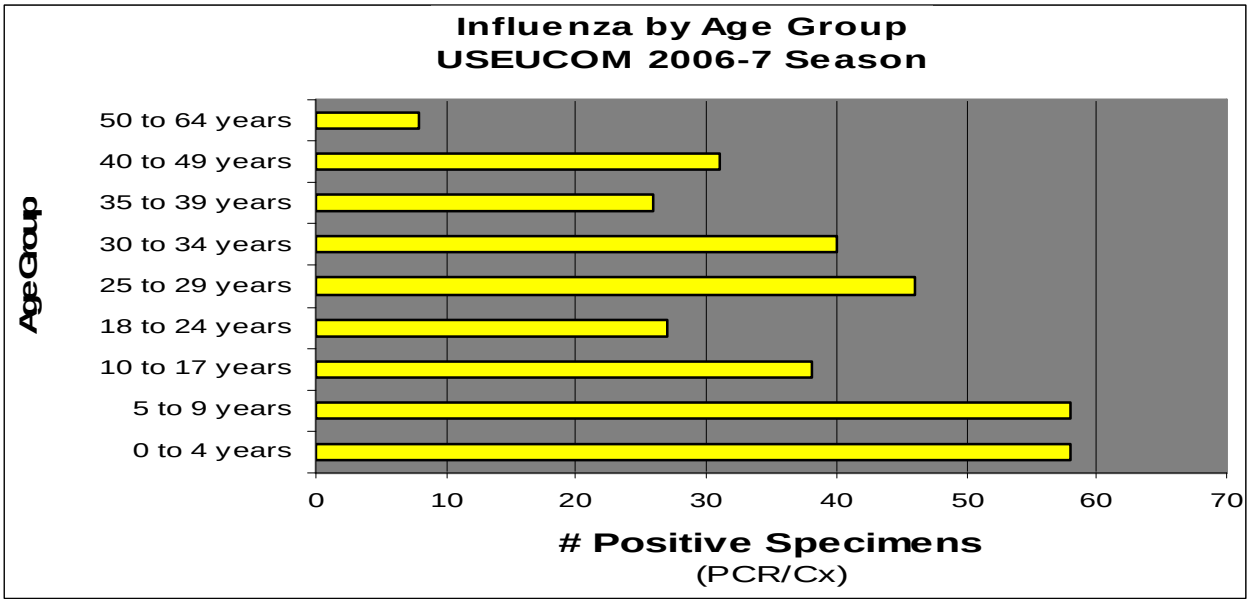
Lab-Confirmed Influenza[a] by Patient Group
USEUCOM 2006-7 Season
1 Oct – 22 Sep (Weeks 40-38)

	Active Duty N=118 Cases (35%)	Other Adult N=64 Cases (19%)	Children N=152 Cases (46%)	Overall N=334 Cases (100%)
Age Range	18 to 56 years	18 to 64 years	0 mo. to 17 years	**1 mo. to 64 years**
Male Sex (%)	86/118 (73%)	11/64 (17%)	88/152 (58%)	**185/332 (55%)**
Rapid Test +(%) [b]	61/114 (51%)	31/64 (48%)	80/148 (54%)	**172/326 (53%)**
Vaccinated (%) [c]	88/118 (75%)	4/64 (6%)	6/143 (4%)	**98/325 (30%)**
Questionnaire (%)	84/118 (71%)	50/64 (78%)	91/152 (60%)	**225/334 (67%)**
Flu Type A (%)	114/118 (97%)	54/64 (84%)	138/152 (91%)	**306/334 (92%)**

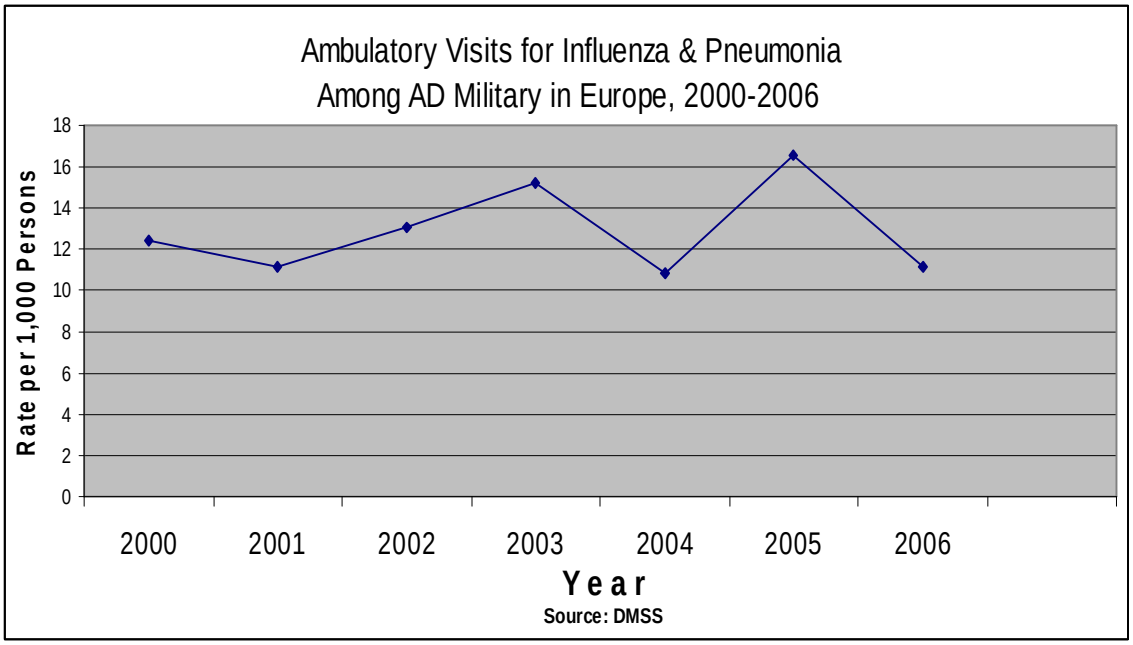
[a] Most specimens are nasopharyngeal swabs; confirmation is via PCR/viral Cx.
[b] Some records did not include rapid antigen test results, so denominators were reduced accordingly.
[c] Influenza vaccines are **not** currently FDA approved for use in infants <6 months of age, the pediatric group at greatest risk for flu-related complications, so this reduced the denominator by 9 (152-9=143). Vaccination of household and childcare contacts **is** recommended to help protect this vulnerable group.

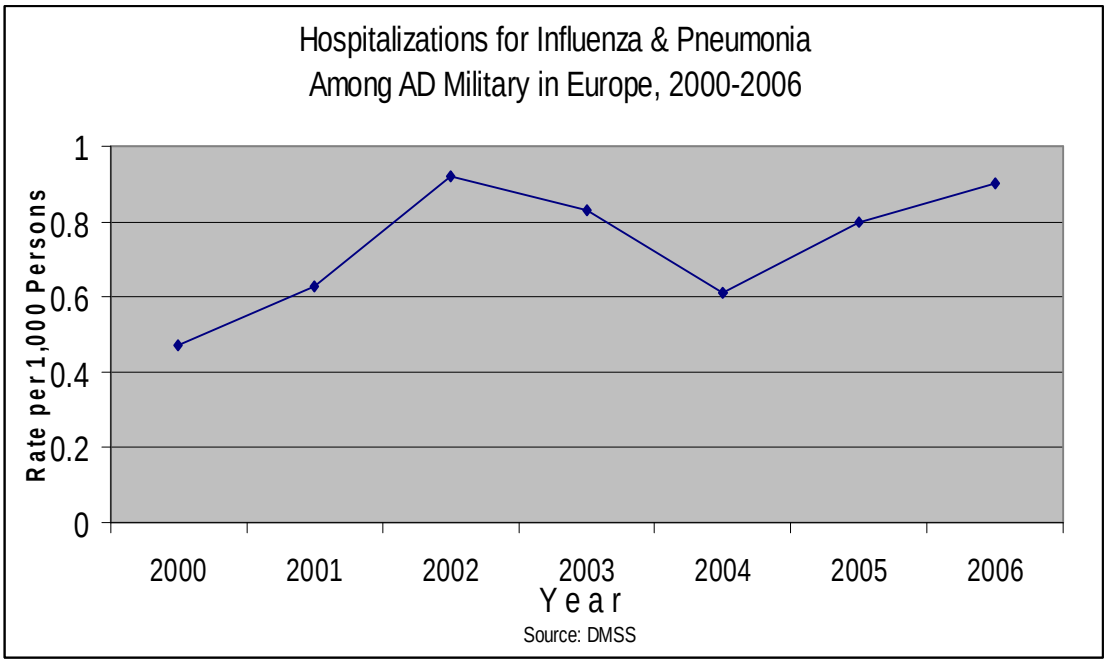
The rapid antigen flu tests were **not** found to perform very well in correctly identifying patients with influenza. In the third row of the table above, note that the overall sensitivity for detecting influenza was 53% in the 2006-7 season. "*False-positive* (and true negative) results are more likely to occur when disease prevalence in the community is low, which is generally at the beginning and end of the influenza season. *False-negative* (and true positive) results are more likely to occur when disease prevalence is high in the community, which is typically at the height of the influenza season". See HHS Pandemic Diagnostics at http://www.hhs.gov/pandemicflu/plan/sup2.html#app6.

The two youngest age groups (0-4 years, 5-9 years) contributed the largest number of cases (58 each), which together made up over one-third (116/334=35%) of all lab-confirmed cases in the AOR. They were followed by the 25-29 year old adults (46 cases). The MHS beneficiary population is relatively young, and no cases detected in adults over the age of 65.

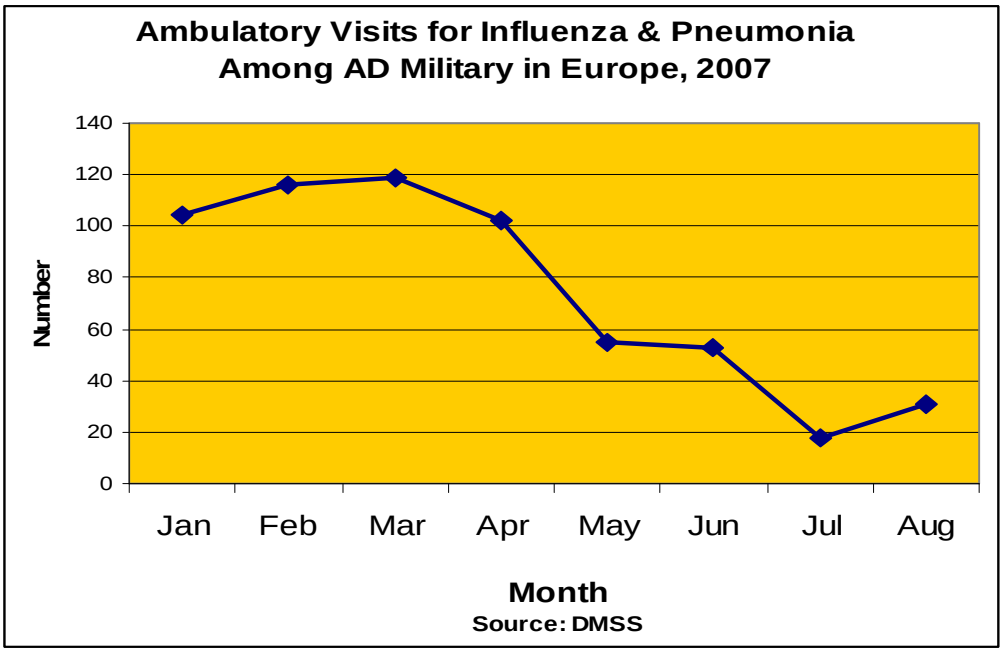


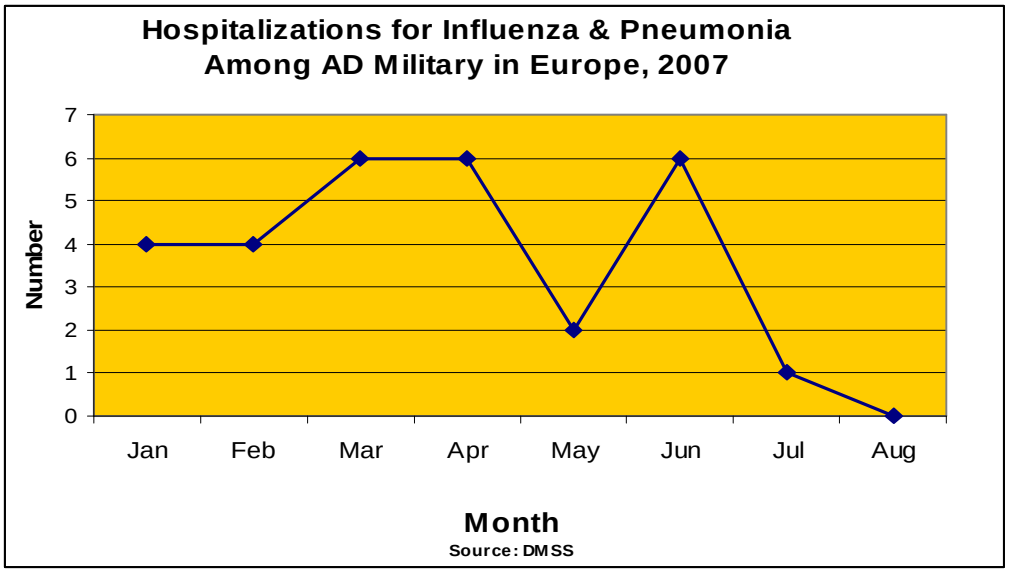
THE DEFENSE MEDICAL SURVEILLANCE SYSTEM (DMSS) was used to query influenza and pneumonia-related hospitalizations and ambulatory visits for AD military members in Europe. These queries can be helpful for looking at trends over multi-year periods, but data lag is a limitation.





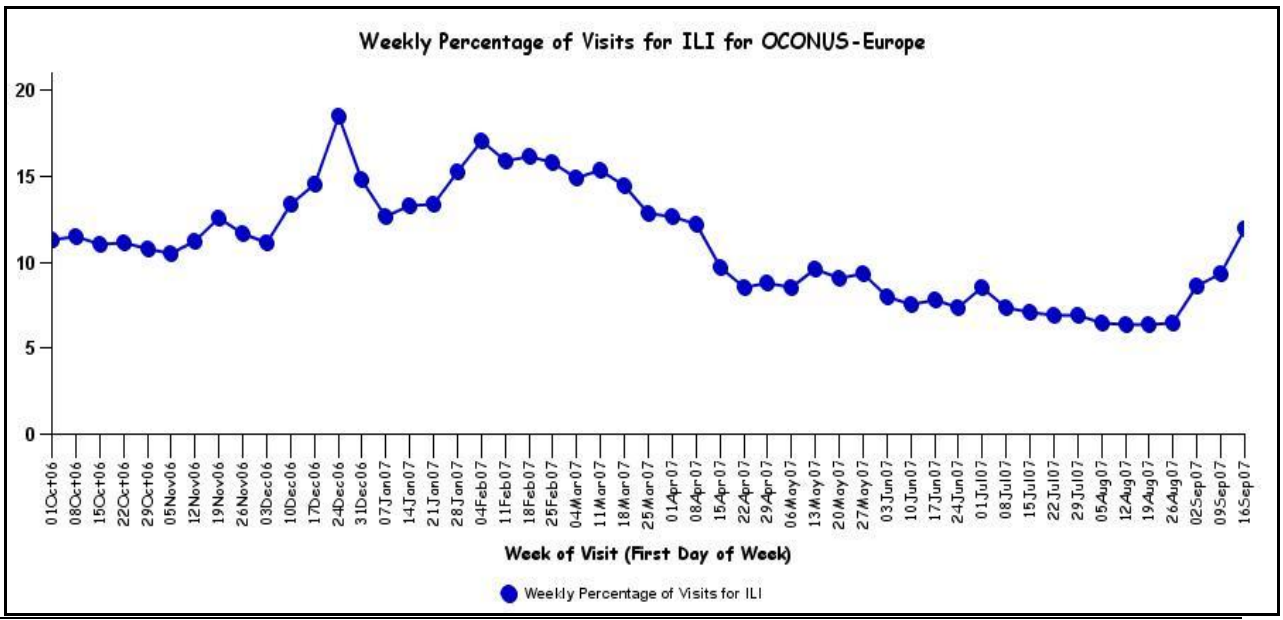
The following graphs are for the current year to date, and are based on counts instead of rates.





HOSPITALIZATIONS - ALL BENEFICIARIES: Beneficiary hospitalizations were queried through CHCS (care in military hospitals) and Tricare-Europe (care on the local economy). Inclusion criteria included admission or discharge diagnoses in the 480-487.8 ICD9 range for pneumonia and influenza, and a timeframe of 01Oct06-30Apr07. A total of 386 hospitalizations were found (225 Tricare, 161 MTFs). The majority of the diagnoses were pneumonia-related (380/386=98%) and not identified with influenza per se. Patient age was readily searchable in the Tricare dataset, and revealed that 60% (136/225) of the hospitalizations involved children. Sixteen-percent (36) of these admissions were infants under the age of one.

ESSENCE SURVEILLANCE FOR ILI, 2006-7*:* The trend graph below displays the percentage of outpatient visits by week that were for ILI during the 2006-7 flu season (date range below is 01Oct 06-16Sep07). Weeks run Sunday-Saturday, and are not displayed on the graph until the week is complete. Values displayed may be artificially high or low, depending on when the claims are received and processed. (Note: This graph is from "ESSENCE IV", which is being de-commissioned.)



Commander, U. S. Army Center for Health Promotion & Preventive Medicine Europe
ATTN: MCHB-AE-ME, CMR-402, APO AE 09180
DSN 486-8951 / COM 011-49-(0)6371-86-8951 / FAX -8938 / Email: EPI@AMEDD.ARMY.MIL
EUCOM PI Watchboard: http://www.chppmeur.healthcare.hqusareur.army.mil/default.aspx?tabid=150

VACCINE EFFECTIVENESS: About 91% of the AD in Europe (all Services combined) had been vaccinated against influenza as of mid-January. Among the 118 lab-confirmed AD cases, the vaccination coverage was only 75% overall (N=88). Vaccine Effectiveness (VE) was calculated by comparing the lab-confirmed influenza attack rates between immunized and un-immunized AD members. Each member was considered "immunized" if s/he was vaccinated >14 days before positive swab collection. The attack rate for un-immunized members was 14.3 per 10,000 while the attack rate for immunized members was 6.8 per 10,000. [(14.3-6.8)/14.3*100%] = 0.52*100% = 52%. Thus, it is estimated that the flu vaccine was effective at preventing influenza illness among 52% of adults in the EUCOM AOR during the 2006-7 season

Sequencing analyses at AFIOH revealed a number of mutations among A/H3N2 specimens from EUCOM, which would point to some diversity from the A/H3N2 2006-7 vaccine strain, and may help explain in part the lower than expected VE. The A/H1N1 specimens from EUCOM that were analyzed did show good genetic similarity with the A/H1N1 2006-7 vaccine strain. Regarding influenza B specimens from EUCOM, only two were sequenced. However, both were characterized as belonging to the B/Yamagata lineage, which differs from the B/Malaysia strain in the 2006-7 vaccine that is of B/Victoria lineage.

The flu vaccine used in the EUCOM AOR during the 2006-7 season was the inactivated injectable formulation. The live attenuated influenza vaccine, FluMist®, will be used in the EUCOM AOR for the first time during the 2007-8 season.

HUMAN CASES OF HPAI A/H5N1: WHO has been tracking human cases of avian influenza A/H5N1 since 2003. As of 10 Sep 2007, 328 cases and 200 deaths (Case Fatality Rate = 61%) have been confirmed. In the European region, no new human cases of avian influenza A/H5N1 have been documented since the outbreaks in Turkey and Azerbaijan in the first quarter of 2006.

SOURCES:

Army Medical Surveillance Activity (Triservice surveillance)
http://amsa.army.mil/AMSA/amsa_home.htm

CDC Influenza Surveillance Reports http://www.cdc.gov/flu/weekly/fluactivity.htm

CDC Influenza Vaccine Effectiveness
http://www.cdc.gov/flu/professionals/vaccination/effectivenessqa.htmhttp:/www.who.int/csr/disease/influenza/recommendations2007south/en/

HHS PI Diagnostics http://www.hhs.gov/pandemicflu/plan/sup2.html#app6

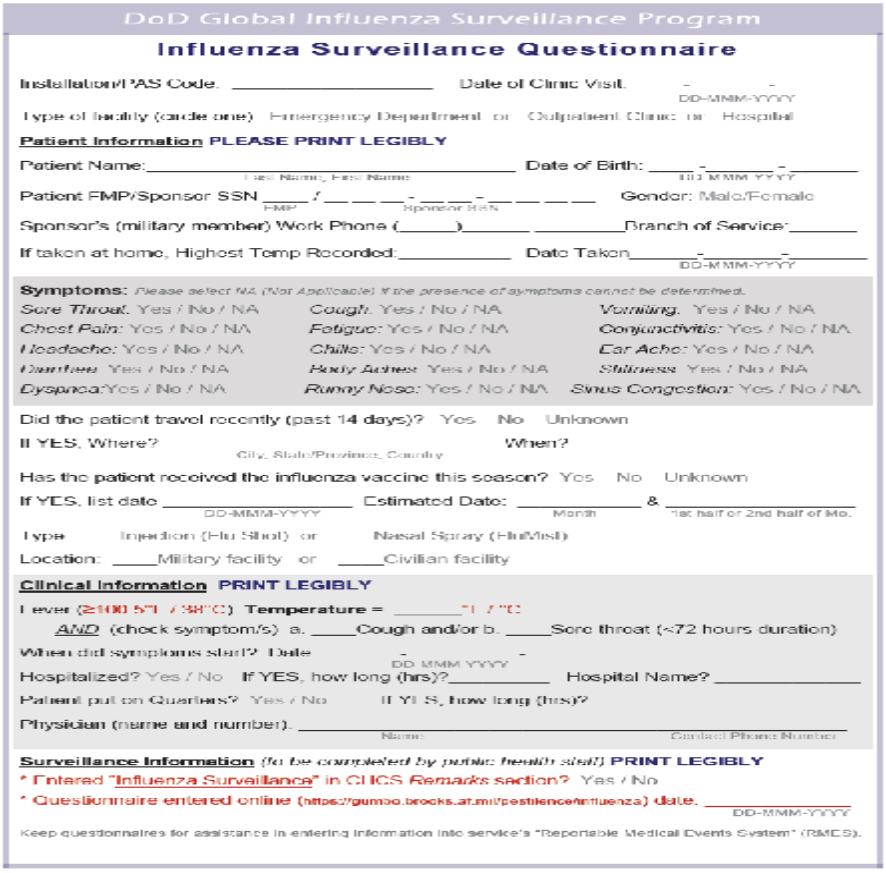
WHO Human Cases of Avian Influenza http://www.who.int/csr/disease/avian_influenza/en/

WHO N. Hemisphere Vaccine 2007-8
http://www.who.int/csr/disease/influenza/recommendations2007north/en/index.html

ABBREVIATIONS

AB	Air Base
AD	Active Duty
AFIOH	Air Force Institute for Operational Health
AI	Avian Influenza
AMSA	Army Medical Surveillance Activity
AOI	Area of Interest
AOR	Area of Responsibility
BE	Belgium
BID	Twice a day
CDR	Commander
Cx	Cx (as in viral Cx)
DE	Deutschland (Germany)
DoS	US Department of State
DMSS	Defense Medical Surveillance System
ECDC	European Centre for Disease Control and Prevention
EISS	European Influenza Surveillance Scheme
ESSENCE	Electronic Surveillance System for the Early Notification of Community-based Epidemics
EU	European Union
EUCOM	(US) European Command
FDA	Food and Drug Administration
GEIS	Global Emerging Infections Surveillance and Response System
HPA	Health Protection Agency (UK)
HSV	Herpes Simplex Virus
ICD-9	International Classification of Diseases, 9th Revision
ILI	Influenza-Like Illness
LRMC	Landstuhl Regional Medical Center
LAIV	Live Attenuated Influenza Virus
MHS	Military Health System
MS	Member State
MTF	Military Treatment Facility
NP	Nasopharyngeal
OASD/HA	Office of the Assistant Secretary of Defense/Health Affairs
PCR	Polymerase Chain Reaction (real time reverse transcriptase)
PHEO	Public Health Emergency Officer
PI	Pandemic Influenza
PT	Portugal
RKI	Robert Koch Institute (Germany)
RSV	Respiratory Syncytial Virus
SARS	Severe Acute Respiratory Syndrome
SD	Standard Deviation
SECDEF	US Secretary of Defense
SOFA	Status of Forces Agreement
U	Unclassified
USACHPPMEUR	US Army Center for Health Promotion and Preventive Medicine-Europe
USCENTCOM	US Central Command
UTD	Up to Date

INFLUENZA SURVEILLANCE PATIENT QUESTIONNAIRE: The EUCOM enhanced surveillance program uses the DoD influenza surveillance questionnaire, shown below.



DoD Global Influenza Surveillance Program

Influenza Surveillance Questionnaire

Installation/ PAS Code: _____ Date of Clinic Visit: _ _ _ (DD-MMM-YYYY)

Type of facility (circle one): Emergency Department or Outpatient Clinic or Hospital

Patient Information PLEASE PRINT LEGIBLY

Patient Name:_____ (Last Name, First Name) Date of Birth: _____ _____ _____ (DD MMM YYYY)

Patient FMP/Sponsor SSN ____ / __ __ __ - __ __ - __ __ __ __ (FMP / Sponsor SSN) Gender: Male/Female

Sponsor's (military member) Work Phone (_____)_____ _____Branch of Service:_____

If taken at home, Highest Temp Recorded:_____ Date Taken_____ _____ (DD-MMM-YYYY)

Symptoms: *Please select NA (Not Applicable) if the presence of symptoms cannot be determined.*

Sore Throat: Yes / No / NA	*Cough:* Yes / No / NA	*Vomiting:* Yes / No / NA
Chest Pain: Yes / No / NA	*Fatigue:* Yes / No / NA	*Conjunctivitis:* Yes / No / NA
Headache: Yes / No / NA	*Chills:* Yes / No / NA	*Ear Ache:* Yes / No / NA
Diarrhea: Yes / No / NA	*Body Aches:* Yes / No / NA	*Stiffness:* Yes / No / NA
Dyspnea: Yes / No / NA	*Runny Nose:* Yes / No / NA	*Sinus Congestion:* Yes / No / NA

Did the patient travel recently (past 14 days)? Yes No Unknown

If YES, Where? (City, State/Province, Country) When?

Has the patient received the influenza vaccine this season? Yes No Unknown

If YES, list date _____ (DD-MMM-YYYY) Estimated Date: _____ (Month) & _____ (1st half or 2nd half of Mo.)

Type: Injection (Flu Shot) or Nasal Spray (FluMist)

Location: _____Military facility or _____Civilian facility

Clinical Information PRINT LEGIBLY

Fever (≥100.5°F / 38°C) **Temperature** = _____°F / °C

AND (check symptom/s) a. _____Cough and/or b. _____Sore throat (<72 hours duration)

When did symptoms start? Date _ _ _ (DD MMM YYYY)

Hospitalized? Yes / No If YES, how long (hrs)?_____ Hospital Name? _____

Patient put on Quarters? Yes / No If YES, how long (hrs)?

Physician (name and number): _____ (Name) (Contact Phone Number)

Surveillance Information *(to be completed by public health staff)* PRINT LEGIBLY

* Entered "Influenza Surveillance" in CHCS *Remarks* section? Yes / No

* Questionnaire entered online (https://gumbo.brooks.af.mil/pestilence/influenza) date. _____ (DD-MMM-YYYY)

Keep questionnaires for assistance in entering information into service's "Reportable Medical Events System" (RMES).

CONTACTS FOR EUCOM INFLUENZA SURVEILLANCE PROGRAM:

LRMC Microbiology Lab, Dept. of Pathology & Laboratory Services (DPALS), Landstuhl:
DSN 486-7809 / COM 06371 86 7809 / (country code 49)
SHIPPING – Civilian Address:
US Army Hospital
Auf dem Kirchberg
ATTN: DPALS, "Flu surveillance"
Gebaude 3738, Zimmer 218
Landstuhl 66849
Germany
SHIPPING - Military Address:
LRMC Microbiology Laboratories, DPALS
BLDG 3738
APO AE 09180

USACHPPMEUR Epidemiology Division, Landstuhl:
DSN 486-7086 / COM 06371 86 7086 (country code 49)
EMAIL: Epi@amedd.army.mil